WHAT IS CLAIMED IS:

1. A lithographic projection apparatus, comprising:

a radiation system configured to provide a projection beam of radiation;

a support configured to support a patterning device, the patterning device configured to pattern the projection beam according to a desired pattern;

a substrate table configured to hold a substrate; and

a projection system configured to project the patterned beam onto a target portion of the substrate, wherein a space in the apparatus comprises a composition containing at least one of (a) and (b), wherein (a) is one or more perhalogenated C_1-C_6 alkanes and (b) is one or more compounds including one or more nitrogen atoms and one or more atoms selected from hydrogen, oxygen and halogen.

2. An apparatus according to claim 1, wherein the composition further contains at least one of:

(c) N_2;

(d) H_2; and

(e) one or more inert gases.

3. An apparatus according to claim 1, wherein the apparatus contains the composition.

4. An apparatus according to claim 1, wherein the one or more alkanes includes tetrafluoromethane.

5. An apparatus according to claim 1, wherein the one or more compounds includes one or more nitrogen hydrides.

6. An apparatus according to claim 1, wherein the one or more compounds includes at least one of ammonia, diazene, hydrazine and salts thereof.

7. An apparatus according to claim 1, wherein the one or more compounds includes nitric acid.

8. An apparatus according to claim 1, wherein the composition further contains at least one of:

(c) N_2; and

(d) H_2.

9. An apparatus according to claim 1, wherein the one or more compounds includes nitrogen dioxide.

10. An apparatus according to claim 1, wherein the composition further contains at least one of:

(c) oxygen;

(d) hydrogen; and

(e) water.

11. An apparatus according to claim 1, wherein the projection beam passes through the space.

12. An apparatus according to claim 1, wherein the space comprises at least a part of the radiation system, or at least a part of the projection system, or at least a part of the radiation system and the projection system.

13. An apparatus according to claim 1, further comprising an activation device configured to produce reactive species of the composition.

14. An apparatus according to claim 13, wherein the activation device produces the reactive species by at least one of exciting and dissociating molecules of at least one of the alkanes and the one or more compounds.

15. An apparatus according to claim 13, wherein the activation device is one of a DUV source, an EUV source, a plasma source, an electrical field, a magnetic field, or an electron source.

16. An apparatus according to claim 13, wherein the activation device includes the radiation system.

17. An apparatus according to claim 1, wherein the composition is a gas, a solid, a liquid, or a beam of molecules.

18. An apparatus according to claim 1, wherein the composition is encapsulated in a microporous media.

19. A device manufacturing method, comprising:

providing a substrate that is at least partially covered by a layer of radiation-sensitive material;

providing a projection beam of radiation using a radiation system;

projecting a patterned beam of radiation onto a target portion of the layer of radiation-sensitive material; and

producing reactive species of the composition, wherein a space through which the projection beam passes comprises a composition containing at least one of (a) and (b), wherein (a) is one or more perhalogenated C_1-C_6 alkanes and (b) is one or more compounds including one or more nitrogen atoms and one or more atoms selected from hydrogen, oxygen and halogen.

20. A method according to claim 19, wherein producing the reactive species includes at least one of the exciting and dissociating molecules of at least one of the alkanes and the one or more compounds.